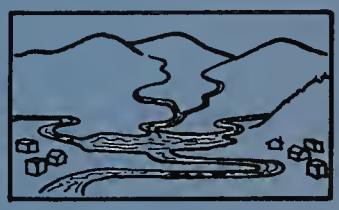
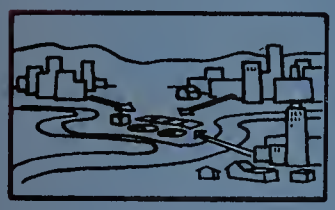
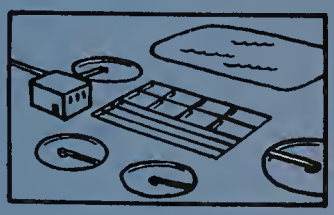
ENVIRONMENTAL PLANNING and ASSESSMENTS FOR WATER QUALITY MANAGEMENT PLANS and PROJECTS







ENVIRONMENTAL PROTECTION AGENCY
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GUIDES TO ENVIRONMENTAL PLANNING, ASSESSMENTS AND IMPACT STATEMENTS FOR WATER QUALITY MANAGEMENT PLANS AND MUNICIPAL WASTEWATER TREATMENT PROJECTS

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION I

JOHN A. S. McGLENNON
REGIONAL ADMINISTRATOR

February 1973
Revised August 1975

OUTLINE FOR ENVIRONMENTAL ASSESSMENTS FOR MUNICIPAL WASTEWATER TREATMENT FACILITIES

With the implementation of the Environmental Protection Agency's Final Regulations for the "Preparation of Environmental Impact Statements," Federal Register, Monday, April 14, 1975, Volume 40 - Number 72, a new and different outline for the preparation of environmental assessments is now required.

This new format appears in Section 6.512 of the Federal Register and is entitled, "Procedures for Implementing NEPA." Subsection (a) describes in detail the necessary information and procedural requirements along with a description of other agency regulations which EPA is required to comply with.

Checklist of Environmental Evaluation Factors for Municipal Wastewater Treatment Facilities

The following list of environmental evaluation factors provides guidance to the preparers and reviewers of environmental assessments for individual projects. The assessment should address all of those factors contained in the list that are pertinent to the project. Other environmental issues associated with the project may exist and should also be covered in the assessment.

Water Quality

1. How does the project conform to the waste treatment management plan(s) for meeting water quality standards or objectives? Discuss effects on water use classifications, criteria and implementation schedules, including the treatment of combined sewer overflows and stormwater.

2. What are the existing (if applicable) and proposed effluent characteristics? Discuss BOD, solids, color, turbidity, pH, temperature, chemical constituents, nutrients, metals, toxics, radioactive material, grease and oil.

3. What beneficial and adverse effects will the project have on aquatic biota and habitats?

4. What physical effects will the project have on hydrology? Include effects on water levels, mixing and stratification, temperature, salinity, sediments and nutrients. If the project will contribute to increased flooding, discuss alternatives considered and measures to mitigate reduction in hydraulic capacity of the floodway or increased downstream flows. Water pollution control facilities should not be located in flood plains or intrude on wetland if there is a feasible alternate site.

5. If spray irrigation is proposed, what effect would such a project have on groundwater or surface water quality? Would such irrigation deplete stream flows during low-flow periods?

6. What measures will be taken to prevent erosion and siltation?

7. If the project will result in the propagation of insects, discuss preventative measures that will be taken to control the problem.

8. Discuss the impact of treated effluent, pump station overflows and bypasses, and combined sewer overflows on shellfish growing areas. Indicate the size and shape of buffer zones.

9. Will the project site require filling that will affect the hydraulics of a stream? For projects in flood plains evaluate the effects on the stream for the 25, 50, and 100 year floods.

Land Application of Wastewater

1. Land Use

   a. Current use of land to be used for application

   b. Current and proposed future zoning and land use of adjacent areas

   c. Proximity to current and planned development areas

   d. Availability of land for expansion

   e. Provisions for buffer zones

2. Climate

   a. Rainfall analysis including quantities and seasonal distribution

   b. Effects of storm intensities on runoff potential

   c. Temperature analysis including seasonal variations

   d. Evapotranspiration rates

   e. Humidity effects on evaporation and plant growth

   f. Wind analysis including velocity, direction, seasonal variations and frequency

   g. An analysis of snow conditions with respect to depth and period of snow cover

3. Topography

   a. Ground slope

   b. The topography of land adjacent to the site. The effects of storm runoff, both from adjacent land onto the site and from the site onto adjacent lands and surface water bodies.

   c. Predict the erosion potential of the site and adjacent land; indicate required corrective action

   d. Flood potential of disposal area

   e. The extent of clearing and field preparation

4. Soil Characteristics

   a. Physical and chemical characteristics

   b. Infiltration and percolation potential

   c. Evaluate renovation and percolation potentials of underlying soil layers. Locate lenses or constraints to flow

5. Geological Formations

   a. Type and description with formations which may provide short circuits to the groundwater noted and thoroughly investigated

   b. The depth to bedrock and formations containing discontinuities

   c. Earthquake potential

6. Surface Water

   a. Proximity to surface water

7. Groundwater

   a. Depth to groundwater

   b. Direction and rate of groundwater flow; determine whether the groundwater will come to the surface, be intercepted by a surface water, or join another aquifer.

   c. Depth and extent of existing or potential perched water

   d. Quality

   e. Current and planned use including the quality requirements for these uses

   f. Location of existing and potential wells, both on site and adjacent to the site

   g. Seasonal variation of water table in existing wells

8. Receiving Water (other than groundwater)

   a. Type of body

   b. Current use

   c. Existing quality

   d. Prescribed water quality standards and effluent limitations

   e. Water rights

Water Supply

1. How and to what extent will the project affect the quality and quantity of any existing or potential public or private water supply - including watersheds, reservoir and groundwater? Will this project directly or indirectly pose health risks to consumers of public or private water supplies? Consider the effects of development on surface runoff in the watershed.

2. If there is a groundwater depletion problem, has groundwater recharge been considered and its effects evaluated?

3. If local water resource demand is high and supply low, has water reuse been considered? What effects would such reuse measures have on meeting water quality needs in the receiving waters?

Social and Economic

1. Will project require relocation of people, disrupt employment opportunities, or impair public services? Include actions covered by Uniform Relocation Assistance and Land Acquisition Policies Act of 1970. Discuss social and economic effects of social disruption.

   Planning guide - Avoid locations in ghettos merely to protect upper and middle class neighborhoods. Minimize relocation of people or employment opportunities. If relocation is necessary, arrange for relocation opportunities. Minimize disruption of public services such as transportation and utilities.

2. If the project will induce growth upon the service area, discuss the effects of such growth on the community. Will other public services and utilities be available to serve such growth when it occurs?

3. Discuss the economic impact of construction and operation and maintenance expenses on the community.

4. Discuss the source and quantity of fuel and power requirements for treatment facilities and pump stations.

Recreation, Historical, Cultural and Aesthetic Values

1. How will siting, construction, and operation of the project affect existing and potential park and recreation areas, open spaces, natural areas, and scenic values? Discuss how the project will affect recreational opportunities in the area due to changes in water quality, location of facilities near parkland, etc.

2. How will project affect historical, archeological, or cultural sites? Consult National Register of Historic Places and discuss how any effects on these properties were taken into account. What measures will be taken to protect these sites?

3. What will be the visual impact of the project? Have facility sites been selected to minimize visual impacts upon the landscape? Are project sites located in wooded areas, open spaces, or other areas of recognized aesthetic value? If so, what alternatives were considered and what measures will be taken to minimize project effects on these areas?

   Planning guide - Conceal rather than site facilities where they intrude upon the scene. Site in concealed valley rather than on key promontory or headland, in commercial-industrial zones rather than in natural areas. Avoid siting across from areas of special interest or use. Lay out structures perpendicular to the river or shoreline rather than longitudinal (and obtrusive) to the river scene. Site back from the shorelines, behind vegetation or rock outcroppings.

4. What architectural and landscaping techniques will be used to blend the structures with the surrounding area?

   Planning guide - Harmonize proposed architectural-landscaping styles, color, texture and materials with physical, historical and cultural setting. Where possible, design the elevations, height, and layout of structures to blend with natural contours, tree cover, and rock formations. Choose color and texture to blend with surrounding rock and vegetation. Choose style that harmonizes with surroundings, either blending or appropriately contrasting.

Land Use

1. How will the proposed project encourage or discourage residential, commercial, and industrial growth within the service area? Will interceptor locations and system capacity induce growth in undeveloped areas or concentrate population in developed areas? Will they be located and scheduled to avoid inducing development in conservation areas, recreation areas, and wetlands?

2. Discuss the method(s) used for estimating future populations and industrial development.

3. How will the project effects on growth conform with federal, state, or local land-use plans for the area? Would such growth appear consistent with the growth goals of the area and the community? When changes in population patterns and growth are significant, their effect on the resource base, including land use, water quality and quantity, air quality, and public services, should be determined.

4. How will the project affect the land-based ecosystems near the facility site, such as wildlife habitat, stream bank cover, and vegetal and wooded growth on rights-of-way?

5. Would the project impair the landscape and/or create irreparable damage to geological formations?

6. What types and amount of land will be affected permanently by construction and operation of the project?

7. Have alternative sites for project structures or interceptor alignments with lesser adverse impact upon the environment been considered?

8. Has consideration been given to restricting future development adjacent to the treatment plant site and interceptors through land acquisition, zoning subdivision, hook-up controls, or other land use policies?

9. Has sufficient land been acquired (in fee or easement) or zoned for future expansion needs, such as tertiary treatment and increased capacity for ultimate design year? Consider prospective higher use standards, higher level of "maximum feasible treatment", and re-use concepts. Is buffer area sufficient to screen project and reduce any odor or noise?

10. Do site planning and layout take advantage of opportunities to develop waterside recreation areas, trails, and buffer zones?

Solid Waste

1. Grit, screenings, and scum

   A. Quantities

   B. Procedures for storage, processing, transportation, and disposal

2. Sludge Disposal

   A. Quantity and characteristics of sludge

   B. Dewatering method

   C. Stabilization method

   D. Method of ultimate disposal

      1. Sludge utilization by land spreading or sludge disposal by landfilling

         a. Location, area, owner and operator of site

         b. Location of site with respect to developed areas. Existing and expected future use of surrounding areas.

         c. Past and present uses of site

         d. Future use of site if not for sludge utilization or disposal

         e. Capacity and useful life of site

         f. Application method and rate

         g. Permeability and pH of soil at point of application

         h. Depth to fissured rock and highly permeable gravel

         i. Quality, use and distance to groundwater in the disposal area

         j. Proximity to surface water

         k. Method of controlling surface water runoff

         l. Precautions to control odors and insects

         m. Frequency of earth cover and material to be used

         n. For utilization for agricultural purposes

            1. Type of vegetation to be grown. Ultimate consumer(s) of cultivated crops

            2. Public health control measures to be utilized

o. Provisions for storage and/or disposal during periods when site cannot be used due to weather or other reasons

p. Local and State agencies that have reviewed site

q. Emergency disposal procedures should regulatory agencies close site

r. Proposed program to monitor site

s. Method of transportation to site

1. Types of vehicles

2. Facilities available for cleaning transportation equipment

3. Local and State permits required for hauling sludge

t. Types of equipment for handling sludge at disposal site and provisions for furnishing it

2. Ocean disposal

a. Because ocean disposal of sewage sludge is strictly controlled by EPA and is subject to strict regulations and criteria, preparers of environmental analyses documents must coordinate their preparation closely with EPA's staff. Therefore, specific factors for consideration will not be presented in this document but will be delineated on a case by case basis.

3. Dried sludge as a fertilizer or soil conditioner.

a. A detailed discussion of the proposed market. Proposed method of disposal if dried sludge cannot be marketed as originally intended.

4. Incineration

a. Incinerating sewage sludge is an environmentally acceptable method of sludge disposal. However, the process does require a thorough evaluation of the impact on air quality in the project area. In addition the incinerator ash must be handled in an environmentally acceptable manner. The criteria for an air quality analysis is presented

in the Air Quality section. With regards to the incinerator ash the quantity, moisture content, disposal method, disposal area, and method of transportation to the disposal area must be discussed. Basically, the items under 2.D.1. above should also be applied in the analysis of ash disposal.

As the solid waste problem is constantly becoming more acute, the EPA Region I office is requesting that applicants for construction grants submit detailed information regarding sludge handling and disposal. A format for presentation of the information required is given in Appendix A.

Air Quality

1. What is the relationship of the project site and prevailing wind patterns to nearby residences, businesses and recreation areas? Consider potential odors from treatment facilities and pump stations.

2. If odor problems can be expected from the project, what precautions will be taken to minimize this effect?

3. Sludge incineration - Before approving grants for the construction of sewage sludge incinerators, EPA, as the agency primarily concerned with the environment and its effect on the public health, requires that the impact on air quality of sludge incineration be completely and correctly assessed. Obviously, the suitability of sludge incineration for final disposal at a wastewater treatment plant will depend upon the environmental and economic suitability of alternate means of sludge disposal, and some consideration of this must enter an assessment of the impact of sludge incineration on air quality. The following questions, however, can be used to exclude sludge incineration from consideration under certain circumstances, indicated by an affirmative answer to the following:

   A. Referencing measured pollutant levels in the area, are National Ambient Air Quality Standards for TSP, SO_2, or NO_2 currently being approached or exceeded?

   B. Citing applicable Federal, State, or local air pollution control regulations, will any conditions of air pollution exist (e.g., violations of Federal NSPS, State air quality standards, etc.)? What measures will be taken to comply with such regulations?

C. Do the results of diffusion modeling of the proposed plant indicate that any long or short term National Ambient Air Quality Standards will be exceeded because of its operation? (Cite incremental increases in TSP, SO_2, and NO_2.)

D. Will the sludge incinerator emit any toxic substance (e.g., lead, mercury, PCB's, etc.) that may have an adverse effect on the environment or the public health? (If this is a potential problem, cite probable emissions of each substance and countermeasures that will be used for its suppression.)

E. Will any public nuisance condition (e.g., from odor, smoke, fugitive dust, or a steam plume) result from operation of the sludge incinerator? (If so, reference countermeasures to be employed.)

F. Could failure to obtain adequate supplies of auxiliary fuel or of auxiliary conforming fuel cause either a substantial increase in the incinerator's impact (C above), production of an unacceptable residue, the appearance of nuisance conditions (E above), or an increase in toxic emissions?

If the above can all be answered negatively, there exists no single reason for rejecting final sludge disposal by incineration because of its effect on the ambient air. It may sometimes be the case, however, that a combination of effects on air quality (e.g., "moderate" increase in TSP with possible heavy metals emissions in an area of borderline air quality) will act to discourage the use of sludge incineration. Such conditions must be evaluated together and on a <u>case by case basis</u>.

To enable an adequate review of any assessment and to enable the reviewer some discretion in interpreting results, assumptions and methods used in completing the air impact study must be clearly indicated. Without such information, there is no assurance that all relevant points have been consistently and reasonably considered. Necessary information (keyed to the above questions) and a format for its presentation is given in Appendix B. Preparation of this material would logically be done by the engineering consultant for the project as it should, by and large, require little additional work.

<u>Noise</u>

1. Have existing noise levels in the project area been measured or estimated?

2. Has noise from present operations or similar projects generated adverse conditions? Have there been any complaints?

3. Discuss noise or vibrations from the proposed project giving special attention to generators and air compressors. Operating frequency, length of operating time, and intensity levels in decibels should be indicated.

4. What control measures will be used? Indicate where silencers, mufflers, or insulated casings will be utilized.

5. Indicate how the noise levels will comply with existing or proposed regulations.

Radiation

1. Does the project involve any collection and discharge of radioactive material from industrial or commercial sources or hospitals? If so, account for the sources and their measures of control.

2. If appropriate, what surveillance programs, records, and emergency plans are proposed?

3. If appropriate, have project and radiological controls been coordinated with responsible Federal, State, and local officials?

Construction

1. Identify all critical impact areas in the project area that could be affected by construction. Areas considered critical are streams, wetlands, forests, parks, steep slopes, highly erodible soil, natural and man-made drainage facilities, and water recharge areas.

2. Discuss the effects of the construction on aquatic life and wildlife in the area.

3. For all stream crossings discuss the construction methods that will be used for each. Discuss special procedures that will be followed for streams that are critical to fish life cycles.

4. For all construction in streams requiring review and approval from the Army Corps of Engineers, indicate the status of their review.

5. What erosion and dust control measures will be taken during construction? Will these procedures preclude sedimentation and turbidity in the nearby waters?

6. Specify areas which will be temporarily or permanently cleared. How will disruption of land forms and clearing of vegetation and wooded cover be restricted? What provisions will be made to restore the construction site to its preconstruction condition?

7. Discuss disposal of land clearance wastes including identification of disposal site(s). Indicate if herbicides, blasting, or burning will be required. Discuss the environmental effects of the proposed method(s).

8. For fill operations, indicate quantities and sources of material.

9. Describe the extent of inconveniences or nuisances to residences or businesses in proximity to the construction site of the treatment facility and/or along interceptor route.

10. Discuss the traffic procedures that will be used specifying any local time limitations on maintaining open trenches. Include effects of increased truck traffic due to a large fill or excavation operation.

11. What measures will be taken to abate construction noise?

INFORMATION FORM

SLUDGE HANDLING AND DISPOSAL

1. Applicant _____

2. Project Location (Street, City, County, State) _____

_____

3. Type of Facility: New _____ Expansion _____ Upgrading _____

4. Description of Facilities: _____

_____

_____

_____

_____

5. Initial: Year _____ Flow (MGD) _____ Population Served _____

Design: Year _____ Flow (MGD) _____ Population Served _____

6. Sludge Treatment at this facility (check applicable items)

____ Sludge Digestion	____ Sludge Lagoons
____ Sludge Thickening	____ Multiple Hearth Incineration
____ Elutriation	____ Fluidized Bed Incineration
____ Vacuum Filtration	____ Heat Treatment
____ Centrifugal Separation	____ Other (Specify)
____ Lime Recalcination	____ _____
____ Sludge Drying Beds	____ _____

7. Sludge storage

Describe method of storage and equipment used. Include storage prior to dewatering, prior to volume reduction (if applicable), prior to haul to disposal facility and storage during any emergency conditions.

_____

_____

_____

_____

_____

_____

8. Quantities and Characteristics of Dewatered Sludge Produced at Facility

	RAW		DIGESTED		(Other-Specify)	
	% Solids	C.Y./WK	% Solids	C.Y./WK	% Solids	C.Y./WK
Primary	_____	_____	_____	_____	_____	_____
_____ (Secondary-Specify)	_____	_____	_____	_____	_____	_____
Mixed P&S	_____	_____	_____	_____	_____	_____
Chemical/Physical	_____	_____	_____	_____	_____	_____
_____ (Other-Specify)	_____	_____	_____	_____	_____	_____

9. For chemically precipitated or conditioned sludge:

a. Indicate chemicals used _____

_____

b. Are any of these recovered? _____ If yes, indicate which ones and percent recovered _____

_____

10. Quantities of (____Wet, ____Dewatered) sludge to be incinerated (if applicable)

	RAW		(Other-Specify)	
	% Solids	C.Y./WK	% Solids	C.Y./WK
Primary	_____	_____	_____	_____
_____ (Secondary-Specify)	_____	_____	_____	_____
Mixed P & S	_____	_____	_____	_____
Chemical/Physical	_____	_____	_____	_____
_____ (Other-Specify)	_____	_____	_____	_____

11. Sludge Transport

a. Describe method of transport and number and types of vehicles used. Include transport from storage to processing, if at another plant, storage to disposal and/or processing to disposal _____

_____

_____

_____

_____

_____

b. Are local or state permits for hauling sludge required? _____ If yes, include a copy of the requirements for this permit.

12. Ultimate Disposal

a. Indicate method(s) of ultimate disposal for sludge or ash from incinerated sludge.

_____ Land Spreading

_____ Sanitary Landfill

_____ Ocean Disposal

_____ Other (Specify)

_____

12. b. Sludge or ash requiring disposal

Quantity: _____ C.Y./WK

Moisture Content: _____ %

c. For land spreading, complete the following:

1) Indicate the type(s) of sludge disposed of by land spreading: wet sludge _____; dewatered sludge _____; ash from incinerated sludge _____

2) Indicate quantities of sludge disposed of by land spreading. If more than one type of sludge is disposed of by land spreading, as indicated in (1) above, supply quantities for each: (specify units)

	RAW		DIGESTED		(Other-Specify)	
	C.Y./WK	% Solids	C.Y./WK	% Solids	C.Y./WK	% Solids
Primary						
(Secondary-Specify)						
Mixed P&S						
Chemical/Physical						
(Other-Specify)						

3) Has this operation been approved by the local health department? _____

State health department? _____ Department of Agriculture? _____

State solid waste agency? _____ If yes, submit copies of approvals.

12. c. 4) Location, area & ownership of site(s) used for land spreading

Street	Municipality	Area (Acres)	Ownership (Public or Private)
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

5) If owned other than by the municipality owning the treatment facility, have long-term contracts been negotiated for use of this land? _____ If yes, until what year? _____

_____

Submit copy of any agreements.

6) During what months will the land spreading operation be conducted?

_____

7) Describe the provision made for storage and/or disposal of the sludge during the remainder of the year _____

_____

_____

8) Describe precautions to be taken to insure that sludge will not run off into nearby watercourses _____

_____

_____

9) Describe precautions to be taken relative to control of odors and insects _____

_____

_____

12. d. For disposal in a sanitary landfill, complete the following:

1) Indicate the type(s) of sludge disposed of in a sanitary landfill: wet sludge _____; dewatered sludge _____; ash from incinerated sludge ____

2) Indicate quantities of sludge disposed of by sanitary landfill. If more than one type of sludge is disposed of by sanitary landfill, as indicated in (1) above, supply quantities for each: (specify units)

	RAW		DIGESTED		(Other-Specify)	
	C.Y./WK	% Solids	C.Y./WK	% Solids	C.Y./WK	% Solids
Primary						
_____ (Secondary-Specify)						
Mixed P&S						
Chemical/Physical						
_____ (Other-Specify)						

3) Has this operation been approved by the local health department? _____

State health department? _____ State solid waste agency? _____

If yes, submit copies of approvals.

4) Location, area & ownership of site(s) used for landfill

Street	Municipality	Area (Acres)	Ownership (Public or Private)
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

5) If owned other than by the municipality owning the treatment facility, have long-term contracts been negotiated for use of this site(s)? _____ If yes, submit copy of agreements.

6) Indicate the year at which each of the above sites will no longer be able to accept sewage sludge or ash and state reason _____

_____

_____

7) Is (will) the disposal site (be) used for the disposal of other solid wastes? _____ If yes, will the sludge be disposed of by itself in a separate area? _____; or will it be mixed with the other solid wastes? _____.

e. If a disposal method other than land spreading or sanitary landfilling is to be used, describe it in detail, indicate the approvals obtained, and supply applicable data. _____

_____

_____

_____

_____

_____

_____

_____

_____

13. Special Waste Handling

a. Indicate emergency procedures for storing, transporting, processing and disposing of the contents of fouled biological treatment units such as digesters, aeration tanks, etc. _____

_____

_____

_____

_____

b. Will septage be accepted at the treatment facility? _____ If yes, how much? _____ and from which towns, cities, etc.? _____

_____

_____

If yes, describe the receiving and handling facilities _____

_____

_____

_____

_____

c. If septage is not accepted, describe methods for treatment and/or disposal to be utilized by the towns, cities, etc., served by the treatment facility _____

_____

_____

3. d. Have provisions been made for storing, transporting, processing and disposal of grit, screenings, and grease? _____ Indicate the quantities of such materials _____ If yes, indicate the procedures to be followed _____

_____

_____

4. Other Comments: _____

_____

_____

_____

_____

_____

_____

_____

Suggested Content and Form for Sewage Sludge Incineration Air Impact Assessment

Background Material

In order to place incineration plant facilities, parameters, and air impact calculations in perspective, a fairly complete schematic of the sludge incineration system should be presented. This schematic should show:

1. Flows (@NDC = at normal design conditions)
   - A. Sludge cake: #wet/min. @NDC
   - B. Combustion and cooling air: #/min., corresponding % excess air, ΔP and T at furnace inlet and outlet @NDC
   - C. Auxiliary fuel (include plume reheat): #/min., @NDC and max. continuous, fuel type
   - D. Ash: #/min. @NDC
   - E. Exhaust: #dry/min, #wet/min, T and ΔP at stack exit, scrubber exit, subcooler exit, and furnace breeching @NDC
   - F. Water: #/min, T @NDC
   - G. Power: output (horsepower) of motors and fans @NDC and max. continuous

2. Components, etc.
   - A. Sludge incinerator: configuration, gross dimensions
   - B. Queneher, scrubber, demister, subcooler: types and location
   - C. Air movers and motors: type and location
   - D. (Separately-) Primary sludge cake analysis including % moisture, % combustibles (with % C, H, N, O, S), % ash, heating value of combustibles (Btu/dry#) and the expected ranges in the % moisture and % ash. Other materials that may be incinerated in significant quantities should be similarly described and the NDC case should be related to consumption of these materials.
   - E. (Separately-) Building dimensions, stack location and dimensions
   - F. Air and exhaust flow controls and operation monitors: type and location

I. Ambient Air Quality Background and Meteorology

1. On a map centered on proposed site of the sewage sludge incinerator and indicating the character (housing, commercial, industrial, etc.) and topographic features of the area, show:

   - A. Location of air pollution sampling sites (or indicate compass heading and distance from site.)
   - B. Location of station used for meteorological data.

2. Provide the following data relevant to the meteorology and air quality of the area:

A. For TSP, NO_2, and SO_2: the annual arithmetic mean; annual geometric mean; annual arithmetic standard deviation; annual geometric standard deviation; highest value; 90, 75, and 50 percentile levels; # of samples; year of record; and method used.
B. Available meteorological data; at least a wind direction-velocity rose.

II. Compliance with Applicable Regulations

For each regulation cited under question 2, state whether compliance will be guaranteed under the contract specifications and indicate the basis of the guarantee (e.g., outline test results, etc. on other similar sludge incinerators).

III. Diffusion Modeling

1. Estimation of plume rise: give the plume rise equation used and briefly state the conditions and assumptions under which it is valid. Keying all numbers to operating parameters (incinerator loading, auxiliary fuel rate, excess air, plume suppression, sludge analysis if not assumed design, etc.), give emission rates, stack exit ACFM, exit velocity, exit temperature, and, if necessary, molecular weight of exit gases.

2. Annual average predicted pollutant levels: indicate what model has been used and state how available meteorological data has been incorporated into it.

3. Worst case daily average pollutant levels: Give the method used in finding worst case pollutant concentrations (except for NO_2) and describe the corresponding meteorological conditions and the probability of their occurrence. Indicate how measured background air quality has been combined with maximum incremental impact to give worst case air quality.

IV. Toxic Emission Potential

1. Present an analysis for trace toxic materials (include toxic metals, PCB's, insecticides, etc.) that may be present in the sludge cake.

2. For each such material present in the sludge in significant concentrations, estimate the probable emissions.

3. Based on these estimated emissions, assess the potential for adverse effects on the public health or the environment. If possible, these toxic emissions or resulting concentrations of toxic materials in the air could be correlated with EPA emission standards (e.g., for mercury) or exposure guidelines (e.g., for lead).

4. If it appears that toxic emissions could be a problem, detail effective controls or procedures that will be used for their reduction.

V. Nuisance Conditions

For each of the following, indicate operating conditions (incinerator, treatment plant, or weather) under which a public nuisance might result. By referring to similar incineration facilities, show that there will be adequate standby controls to abate any nuisance:

1. Odor and smoke
2. Fugitive dust
3. Steam plume

VI. Evaluation of Disincentives for Proper Control

If adequate supplies of suitable auxiliary fuels are unavailable or if costs of such fuels discourages proper operation of the incinerator, an air pollution problem may result. Accordingly, the following information should be provided.

1. Estimate yearly average and maximum hourly use of auxiliary fuel. Break these rates down further according to
   A. Fuel for proper sludge combustion
   B. Fuel for afterburning (say, for odor control)
   C. Fuel for plume reheat

2. By citing estimated fuel costs, maintenance costs, incinerator characteristics, etc. evaluate the use of heat recovery devices.